# PROFESSIONAL TRAINING OF FUTURE LIBRARY SPECIALISTS IN THE ERA OF DIGITAL TRANSFORMATION

## FORMACIÓN PROFESIONAL DE FUTUROS BIBLIOTECARIOS EN LA ERA DE LA TRANSFORMACIÓN DIGITAL

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## ABSTRACT

The article focuses on the educational preparation of future library specialists in the context of digital transformation. It argues that modern librarianship requires new approaches to professional training that combine technological proficiency, pedagogical competence, and ethical responsibility. The study, based on historical-comparative and analytical methods, traces the evolution of the librarian's professional ideal from antiquity to the present to identify elements that remain relevant for contemporary education. The results show that digitalization has transformed libraries into multifunctional learning spaces where specialists act as educators, mediators, and data curators. Consequently, university programs in library and information science must integrate digital literacy, user-centered communication, and media education into their curricula. The research concludes that the future of librarianship depends on the quality of education that prepares specialists not only to manage information resources but also to guide society in critical and ethical engagement with knowledge.

## Keywords:

Education, library science, professional training, digital transformation, information literacy, future specialists.

## RESUMEN

El artículo se centra en la preparación educativa de los futuros bibliotecarios especialistas en el contexto de la transformación digital. Argumenta que la bibliotecología moderna requiere nuevos enfoques de formación profesional que combinen la competencia tecnológica, la competencia pedagógica y la responsabilidad ética. El estudio, basado en métodos histórico-comparativos y analíticos, traza la evolución del ideal profesional del bibliotecario desde la antigüedad hasta la actualidad para identificar elementos que siguen siendo relevantes para la educación contemporánea. Los resultados muestran que la digitalización ha transformado las bibliotecas en espacios de aprendizaje multifuncionales donde los especialistas actúan como educadores, mediadores y conservadores de datos. En consecuencia, los programas universitarios de bibliotecología y ciencias de la información deben integrar la alfabetización digital, la comunicación centrada en el usuario y la educación mediática en sus planes de estudio. La investigación concluye que el futuro de la bibliotecología depende de la calidad de la educación que prepara a los especialistas no solo para gestionar los recursos de información, sino también para guiar a la sociedad en un compromiso crítico y ético con el conocimiento.

## Palabras clave:

Educación, bibliotecología, formación profesional, transformación digital, alfabetización informacional, futuros especialistas.

## INTRODUCTION

Education today faces the challenge of preparing library professionals capable of navigating a rapidly changing digital environment (Ninh & Nguyen, 2025). The professional training of future librarians demands a comprehensive approach that integrates not only technical expertise but also pedagogical, ethical, and cultural awareness, enabling them to act as mediators between knowledge, technology, and society. In this context, professional education in library and information science becomes a strategic factor for the preservation and evolution of intellectual culture (Acosta et al., 2025; Chernova et al., 2025; Grudtsina et al., 2025). The emergence of new digital ecosystems, characterized by data abundance, algorithmic mediation, and virtual communication, transforms the mission of libraries and redefines what it means to be a library professional in the twenty-first century.

The library, as a social institution, has existed for several millennia, evolving alongside civilization itself. At each historical stage, a particular professional ideal was formed—a dynamic set of knowledge, competencies, and values that shaped the librarian's role. This ideal was never static; it continuously adapted to cultural, technological, and social transformations, reflecting the intellectual demands of its era. Exploring these changes allows us to identify which elements of professional identity maintain their relevance in the digital age and which require reconfiguration to meet new challenges.

According to Sukiasyan, the quality of library services and the efficiency of the entire library system depend fundamentally on the professionalism of its specialists. In the twentieth century, Russian librarians exemplified deep devotion to their vocation, combining scholarship, service, and a profound ethical sense of mission. Among them, Lyubov Borisovna Khavkina (1871–1949), Margarita Ivanovna Rudomino (1900–1990), and Vera Alexandrovna Artisevich (1907–1999) famously expressed the sentiment: *"I cannot imagine my life without a library"* (Sidorova, 2017, p. 195). This phrase encapsulates the timeless emotional and intellectual commitment that defines the librarian's identity—a dedication that remains essential even as professional practices evolve.

Yet, modern librarianship faces a paradox. As Lopatina (2015) observes, many contemporary challenges arise from the contradiction between structural traditions that perceive the library mainly as a material institution and the librarian as an active agent of ideas, theories, and social innovation. Drawing upon M. Archer's theory, the librarian's role in modern socio-informational processes emerges from the fusion of social and professional identities. Librarians must therefore determine which structural elements of their profession should be preserved and which must change to sustain the social relationships embedded in library work.

Modern libraries have transcended their original function as repositories of printed materials, becoming multi-functional information and communication hubs. Digital technologies fundamentally alter information workflows, with electronic catalogs, open educational resources, digital repositories, virtual reading rooms, and interactive databases now integral to library ecosystems. As a result, librarians are expected to master not only traditional competencies in cataloging, classification, and bibliographic analysis but also digital fluency, data management, and familiarity with emerging technologies such as artificial intelligence and big data analytics (Cerny, 2021). However, as the process of digitalization advances, the essence of librarianship also undergoes philosophical transformation: it is no longer defined solely by the custody of knowledge but by the capacity to guide, interpret, and teach. The librarian of the digital age must be a mediator of meaning, a navigator in virtual environments, and a tutor in information literacy.

This redefinition of professional identity necessitates a reconsideration of the librarian's educational foundation. The study of the profession's historical evolution allows us to identify enduring values: such as the preservation of cultural heritage, intellectual freedom, and accessibility of knowledge, while incorporating new digital and ethical competencies required in contemporary contexts (Pisarevskiy et al., 2022; Zhukova et al., 2024).

From the perspective of higher education, training programs must anticipate technological transformations rather than merely react to them (Gazizova et al., 2025). Curricula in library and information science should therefore include modules on digital curation, data ethics, artificial intelligence integration, cybersecurity, and communication pedagogy. At the same time, educators must safeguard the humanistic essence of the profession by fostering librarians as mentors capable of cultivating critical thinking, ethical information use, and inclusive access to knowledge. This dual orientation: technological proficiency combined with cultural and ethical mediation, defines the new educational paradigm for the twenty-first-century librarian.

Historically, the professional ideal of the librarian has deep roots. From ancient scriptoria, where scribes served as the first guardians of written heritage, to medieval monastic libraries that preserved intellectual traditions, librarians have embodied the commitment to knowledge preservation. The Enlightenment brought a new principle, universal access to information, transforming librarians into educators and public servants. The nineteenth and twentieth centuries institutionalized librarianship as a scientific and ethical profession, codifying standards of cataloging, public service, and intellectual responsibility (Zavorykin et al., 2025).

In today's digital era, it is vital to sustain this historical continuity while embracing innovation. Librarians must balance the traditional values of preservation and access with the opportunities of digital transformation (Fedorchuk et al., 2025). Ethical dilemmas multiply in this new environment: ensuring equitable access amid digital divides, protecting user data while promoting open information, and curating digital resources responsibly in the face of information overload. Such challenges demand not only technological skill but also deep ethical reflection.

Therefore, modern library education must merge traditional and innovative aspects, equipping students with both technical mastery and reflective capacity. Core competencies now include:

- maintaining expertise in printed resources alongside digital fluency;
- developing soft skills in communication, pedagogy, and mediation;
- fostering a digital culture informed by ethical awareness of AI, big data, and blockchain applications in knowledge preservation.

The mission of universities that train librarians is thus twofold: to produce technically proficient experts and to cultivate reflective professionals who recognize their social role in shaping an informed and critical citizenry. This goal can be achieved through project-based and experiential learning, where students design digital library services, engage with real-world ethical dilemmas, and collaborate with users. Such pedagogical approaches enable them to internalize the principles of openness, inclusivity, and life-long learning that define the modern information society.

Ultimately, studying the genesis of the professional ideal in librarianship, tracing its evolution from antiquity to the digital age: has both theoretical and practical significance. It allows us to identify the stable core of the profession, to outline the directions for competency transformation, and to reinforce the ethical and educational foundations upon which the future of librarianship will be built. In a world characterized by information overload and disinformation, libraries remain crucial centers of media literacy, digital hygiene, and cultural continuity. The librarian, once the keeper of scrolls, now emerges as a mentor in the digital realm, guiding humanity through the complexities of the information age.

## MATERIALS AND METHODS

The research is based on a historical-comparative and analytical approach, which allowed the authors to trace the genesis of the professional ideal of librarianship from antiquity to the digital age. A systematic review of sources was carried out, including classical works on the history of libraries, documents of library practices in different historical epochs, and contemporary studies addressing digital transformation, artificial intelligence, and big data in the library field (Mamedova et al., 2025). The study combined descriptive and interpretive methods to identify stable elements of the profession and to reveal how technological, cultural, and social changes influenced the competencies and mission of the library specialist.

In addition, the research used an interdisciplinary framework, integrating pedagogical, sociological, and cultural perspectives to understand the evolution of the librarian's professional role. Content analysis of publications, archival materials, and official data from Russian and international sources made it possible to reconstruct the continuity of professional ideals and outline their transformation under the influence of digitalization. The methodological design also included problem-oriented analysis, which emphasized ethical dilemmas, professional standards, and the integration of new digital competencies into the librarian's profile.

Special attention was paid to the educational implications of these transformations. The analysis considered how higher education institutions and library schools can adapt curricula to include digital literacy, data ethics, and user-centered pedagogy. The methodological approach therefore not only traced the historical evolution of the profession but also identified pedagogical strategies for training a new generation of librarians equipped for the digital environment. This educational dimension connects the study's historical findings with practical recommendations for improving professional education in the library and information sciences.

Let us turn to the history of librarianship, which demonstrates how technological innovations influenced the professional requirements for specialists.

Antiquity: In the Library of Alexandria (3rd century BC), librarians such as Callimachus developed a cataloging system—the Pinakes, which required deep knowledge of literature and systematic thinking. The true flourishing of the profession is associated with this period. Librarians of that time, for example, Zenodotus of Ephesus, Callimachus, and Eratosthenes, combined different functions. They were scholars who edited and commented on texts; systematizers, whose duties included the development of catalogs, such as Callimachus' Pinakes; and also translators—one of the works in this area was the translation of the Bible into Greek. The work of librarians was equated with intellectual service, and their status was close to that of court scholars.

Middle Ages: In monastic scriptoria (for example, in the monastery of Saint Gall), scribes (scriptors) combined the functions of calligraphers, translators, and keepers of texts. Here, monks acted as librarians, also performing a number of duties. They copied manuscripts, engaged in censorship—checking texts for compliance with Church doctrine. They also served as teachers in monastic schools. The status of the monks was determined by religious authority, but their social influence was limited to the church hierarchy.

The Age of Printing (15th–17th centuries): This period became a turning point for libraries. With the invention of printing, their social status changed dramatically. Humanists such as Pico della Mirandola and Erasmus of Rotterdam saw libraries as instruments of enlightenment. The first public libraries, for example, the Ambrosiana in Milan and the Bodleian in Oxford, required cataloging specialists. Librarians began to engage in the systematization of printed publications, which led to the emergence of the first library catalogs.

At this historical stage, librarianship was inseparable from education itself. Libraries served as the foundation of universities, and librarians acted as educators, curating knowledge for scholarly communities. The continuity between libraries and education remains crucial today: as the university's information infrastructure expands, librarians become co-authors of the learning process, shaping students' research skills and media literacy. The educational function of the library, therefore, evolves alongside its informational one, requiring future specialists to master both didactic and digital methodologies.

19th – early 20th century: Professionalization and democratization. Melvil Dewey (1851–1931) standardized librarianship and founded the first library school. Librarians became social reformers; for example, in the United States they promoted the idea of universal literacy. The functions of libraries expanded, with educational and cultural roles being added.

At the same time in the USSR (1920s–1980s), other changes occurred: the librarian became an ideological worker. Their duties included selecting literature according to the party line and "eliminating illiteracy." The profession had high social status, but creative freedom was limited.

The emergence of specialized library schools marked a decisive turn toward the institutionalization of professional education. By the early 20th century, training programs began to combine archival and bibliographic theory with elements of pedagogy and ethics. Today, this legacy continues in higher education curricula, where the focus is shifting toward competency-based learning: digital curation, data literacy, user-centered communication, and the ethical management of information resources. This pedagogical continuity ensures that the profession evolves without losing its intellectual and humanistic base.

Late 20th – early 21st century: Crisis and digital transformation. The internet spread everywhere (1990s–2000s), and for the first time stereotypes about the "uselessness" of libraries began to appear. However, libraries successfully adapted to the new conditions. Automated library systems were introduced, for example MARC in the 1960s, the use of which required library specialists to have skills in working with computer databases.

Modern Trends (2020s). Today, modern libraries go beyond their traditional functions. As practice shows, they are transforming into multifunctional cultural and educational centers, where not only books are stored and distributed, but also a space is created for intellectual growth and personal creative development. One of the main directions of transformation is the digitalization of library services. The rapid spread of electronic devices has encouraged users to prefer digital formats of information. This fact has compelled libraries to introduce innovative solutions into their work. Now, through a library, one can gain unlimited access to e-books, scientific journals, and multimedia technologies. To obtain a book, it is no longer necessary to visit the library: the development of information technologies has reached such a stage that a book can be ordered online and received in electronic form. Thus, this period reflects the general trends of the information society, which is characterized by the transition to digital technologies with the creation of a comfortable space for creativity and social interaction.

Educational implications of these transformations are profound. The digitalization of libraries demands that higher education prepare specialists who not only manage digital repositories but also teach users to critically interpret

data and navigate online environments. Training programs must therefore integrate project-based learning, where students design digital services, practice metadata structuring, and simulate user interaction. These pedagogical innovations transform the library profession into a field of active education, emphasizing lifelong learning and community engagement.

Among modern initiatives that have contributed to a significant breakthrough in the field of digitalization of librarianship, it is worth noting the project of the Russian State Library (RSL) to adapt the Library-Bibliographic Classification (LBC) to the principles of the Semantic Web. This project aims to create a networked knowledge organization system capable of full interaction with international data vocabularies (Linked Data) in the global information space.

Another area of activity that libraries have faced during the development of information technologies is the digitization of library collections. In the United States, most of a library's holdings can already be accessed in digital format. In Russia, this process is also developing rapidly. As an example, one can cite the National Electronic Library (NEL), which contains digital copies of millions of books, journals, and other literature. One of the first libraries to engage in the digitization of its collection was the State Public Historical Library of Russia (Galiullina, 2023).

Among modern library services (electronic document delivery, virtual reference, virtual legal information centers, etc.), virtual reading rooms (VRRs) (Stolyar, 2020) have seen especially active development. Today, the virtual reading room represents a complex digital organism in which educational and research skills can be successfully developed. A VRR creates a place where the user not only gains access to information but is immersed in a holistic intellectual space. This can be achieved through the integration of various resources, ranging from the digitization of rare editions to multimedia materials.

From an educational standpoint, virtual reading rooms become laboratories for experiential learning. They allow library science students to practice digital mediation and user support in real time. As academic institutions implement such environments, students can experiment with AI tools, metadata systems, and content verification practices, turning theoretical knowledge into professional competence. This alignment between technological practice and pedagogy ensures that education keeps pace with the realities of digital librarianship.

It is especially important to consider the problem of applying artificial intelligence in librarianship education, because at present it has affected almost all areas of activity. Artificial intelligence is a broad concept that denotes the creation of intelligent systems capable of imitating human thought processes and behavior (Kurbanov, 2024).

The appearance of artificial intelligence in libraries has significantly influenced their activities. Libraries now have wide prospects for improving library services and optimizing the management of information resources. However, it is important to remember the negative aspects as well: the introduction of artificial intelligence is characterized by increased attention to ensuring information security and protecting the personal data of library visitors. Libraries collect a large array of data about their users, ranging from personal information to preferences and visit histories. The use of artificial intelligence will speed up the data processing process, but one must not forget the risk of confidential information leakage.

There is another problem with the introduction of artificial intelligence into library work. It concerns the fundamental principles of intellectual freedom and the development of critical thinking among readers. Artificial intelligence presupposes the use of complex algorithms that generate personalized recommendations based on the interests of library users. At first glance, this technology simplifies navigation, but there are certain risks. AI algorithms may create certain restrictions, selecting content that corresponds only to a particular theme. As a result, there is a risk of an "information bubble," where the reader receives only the information that corresponds to their views and beliefs. This negatively affects critical thinking, since the reader will not be exposed to alternative positions and opinions, which leads to a narrowing of horizons. To prevent this, libraries must strive to maintain a balance between the convenience and efficiency of new technologies and the preservation of their main mission—to ensure equal access to all available information. Thus, the introduction of artificial intelligence requires a conscious approach and the development of special strategies.

Librarianship is one of the oldest types of information activity. The uniqueness of the librarian's profession lies in its ability to meet the basic informational needs of individuals and society, providing all the necessary conditions for understanding the world, cultural leisure, and full participation in social life.

An essential aspect of the library profession is its historical continuity. This profession emerged long before the advent of mass computerization and digitalization, since from the earliest times people needed a constant exchange of knowledge and information. The earliest forms of storing and transmitting knowledge were formed in antiquity,

which was reflected in the structure of social institutions and cultural practices. Today, the profession of library specialist is the evolutionary continuation of centuries-old traditions of human interaction with information.

The process of forming the library profession was distinguished by a complex structure. Each historical stage introduced new types of activities related to the processing and dissemination of information. Until the mid-20th century, this process was expressed not only in the emergence of new specialties but also in the formation of independent fields that specifically specialized in aspects of informational activity. Despite large-scale changes in the structure of librarianship, a certain stability of social needs can still be observed, which creates the basis for the relationship between librarian and reader. This strong connection reflects the fundamental nature of the institution itself, ensuring the fulfillment of one of society's most important social functions.

However, today the era of globalization and digital technologies is gradually erasing the boundaries between traditional fields and future professions oriented toward working with information. A process of integration of professional communities is taking place, thereby demonstrating the unified character of the social functions of different categories of workers.

## CONCLUSIONS

Our study shows that libraries today are rapidly transforming through the integration of electronic catalogs, digital archives, virtual reading rooms, and artificial intelligence tools. These changes are redefining the librarian's professional identity and highlight the urgent need to prepare a new generation of specialists capable of operating in a complex digital environment. The librarian of the future must not only manage information but also teach others how to find, interpret, and evaluate it critically. For this reason, professional education in library and information science acquires a strategic role. Universities must revise their curricula to ensure that students gain both technological proficiency and pedagogical competence, learning to act as digital mentors and educators in the information society.

Therefore, the professional activity of the future library specialist is undergoing significant changes. Now the modern librarian must combine both traditional and digital competencies:

- Information mediator – assisting with navigation in the digital environment;

- Curator of digital content – selecting and verifying online resources (for example, combating fake information);

- IT consultant – teaching users how to work with electronic resources;

- Data analyst – applying library analytics to improve services.

The process of training future librarians should combine theoretical knowledge of information systems with practical experience in digital mediation, communication, and user education. In this way, the educational system becomes the foundation for shaping library professionals who can preserve the humanistic mission of librarianship while leading its digital evolution.

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## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in the writing, given that participation has been collective and consensual.